Amendments to the Specification:

The Examiner objected to the specification under 37 CFR 1.71 as being ambiguous and incomprehensible because the word, "frame" is used across the specification without any distinction between "glass frame" and "image frame" or any other frame. The Examiner required that the Applicant submit an amendment which clarifies the disclosure by using the word, "glass frame" when "frame" is used to mean "glass frame," and identify what is meant by frame when "frame" does not mean "glass frame."

Applicant hereby submits the following replacement paragraphs to the Specification which clarifies the disclosure by using the word, "eyeglass frame" when "frame" is used to mean "eyeglass frame," and identify what is meant by frame when "frame" does not refer to "eyeglass frame."

At Page 1, line 4 through Page 2, Line 9, please see below the following replacement paragraphs for the Section labeled "BACKGROUND OF THE INVENTION":

This invention relates generally to eyeglasses and, more particularly, to a method and apparatus for designing and modifying the shape of eyeglass lenses and the front rims of eyeglass frames.

Eyeglass frames ~~(hereinafter referred to as "frames")~~ typically have a particular style (the combination of material, color, texture, feature decorations, and overall appearance) and a particular shape (the geometric description of the contour of the front rims of the eyeglass frame). For each style there may be several different shapes (e.g. round, square etc.), and for each shape there may be several different styles (metal, plastic, translucent, engraved, etc.). Eyeglasses, the combination of eyeglass lenses (hereinafter referred to as "lenses") and eyeglass frames, typically include lenses having a certain shape, eyeglass frames having a matching shape, a certain style, and a particular combination of functional elements (legs, nose pads and other functional elements).

In the eyeglass industry there is a conflict between a customer's desire for personalized design and the mass production employed by the industry. On one hand, it is believed that eyeglasses greatly influence the looks and perceived character of a customer, who often wears the glasses daily for long periods of time. This influence drives a desire to obtain a personalized design that fits a variety of criteria (e.g. facial features and style preferences of the customer, current fashion guidelines, social constraints etc.). On the other hand, the manufacturing industry operates on a large scale production in which eyeglasses are distributed to consumers via retailers. This large scale production causes the need for standardized design of eyeglasses. It appears that the industry has addressed this conflict by producing a large variety of shapes and styles, that customers review in a lengthy and often complex selection process. In addition, retailers stock a large inventory of eyeglass frames, which changes often, and hire a

relatively large number of experienced employees to guide customers in their selection process.

In today's optical stores, it is typically the responsibility of the retailer to translate a customer's personality, style, and social preferences into shapes and styles of ~~glass frames~~ eyeglass frames, leading to a lengthy and frustrating process for the customer. The process becomes even more lengthy and frustrating for the customer when the retailer is not experienced or esthetically sensitive, does not properly communicate with the customer, or is just trying to serve more than one customer at a time.

At Page 2, line 10 through Page 4, Line 22, please see below the following

replacement paragraphs for the Section labeled "BRIEF SUMMARY OF THE

INVENTION":

In one embodiment, a user utilizes a method and system to design, select, and purchase eyeglasses. The user accesses the system and visualizes an inventory of eyeglass styles and shapes previously stored in a database and displayed by the system. The user selects a particular eyeglass style and "virtually tries on" the selected eyeglasses in a size that matches the user's facial features. In addition, the method and system allow the user to interactively modify the choice by changing the shape, style, and color of the eyeglass frames. The system reviews the choices made by the user and provides a notification to the user if a selected modification is not allowed for the particular eyeglass frame chosen by the user. In an alternative embodiment, the system only allows the user to make interactive modifications that can be implemented at the optical store.

A user is able to modify the design while satisfying predetermined constraints due to manufacturing procedures and materials, as well as inventory status. In addition, a user is able to interactively modify previous choices by specifying a desired "character", e.g. more/less aggressive/assertive/ personable etc. The system stores the current choice of style for later retrieval and comparison with other choices. The system further suggests alternative shapes and styles that reflect previous choices of the customer, or of other customers with similar taste preferences, utilizing collaborative filtering. The system also interfaces to machine tools (e.g. lens-cutting devices or eyeglass frame bending devices) that fabricate the selected design of shape and style and have the selected design ready to try on at an optical store. The system can be accessed remotely, such as from a home of the user, via a computer and an Internet connection, or other communication channel.

More particularly, the present method includes receiving at least one digital image of a face of a person, performing basic image processing operations such as color or light compensation, displaying to the user a variety of eyeglass shapes and styles available

from manufacturers and retailers, matching a size of a selected eyeglass frame to a facial size and features of the person, and receiving input information such as inter-ocular distance or prescription details. In one embodiment, the system alters the image of the eyeglasses according to a motion of the person's head to simulate the appearance of wearing the eyeglasses on the person's face. In addition, the method includes interactively modifying the selected style and shape of the eyeglass frame while satisfying constraints due to manufacturing process and inventory. The system stores the generated images for later retrieval and comparison of different styles.

In another embodiment, the method further includes superimposing the selected eyeglasses to the digital image of the person's face to generate a virtual image of the person wearing the selected eyeglasses while moving. The system displays a visualization of the head of the person at video-rate and selects and tracks a number of features on the person's face. The system estimates the three-dimensional motion of the head, compensates for the motion, modifies the appearance of the model eyeglass frame, and superimposes the eyeglass image to make the eyeglasses appear stationary on the person's face.

In a further embodiment, the method and system can be utilized to modify the displayed shape of selected eyeglass lenses and front rims. The system includes a database of maps for shape, i.e., the position of a finite number of control points that determine the contour of the lens and the rim, and perceptual qualities, i.e., the "strength" of each adjective as recorded during experimental trials or setup by the retailer or by experts. The system modifies the selected shape by receiving information from the user regarding the amount of each descriptive quality. The system adapts the database to the clientele of a particular optical store and performs collaborative filtering to recommend shapes and styles that match the choices of previous customers with similar preferences.

In yet another embodiment, the system is given (e.g. by the manufacturer, based upon the material chosen) the constraints that a particular eyeglass frame must satisfy, e.g., the maximum curvature, tangent at the hinges and bridge, maximum size of the lenses, and others. The system verifies that the constraints of the selected eyeglass

frames are met during the interactive modification procedure. The system also interfaces with machine tools for grinding eyeglasses and for shaping rims of eyeglass frames.

In a still further embodiment, the system is accessed remotely by a user who logs onto a remote access site and inputs one or more photographs of the person, or a live video stream. The user also inputs lens prescription data, when applicable, as well as the shape and style data. The system receives the information and transmits the shape and style data to eyeglass frame and lens manufacturers, who then ship the selected eyeglasses directly to the customer.

The above described system and method allow a customer to personalize the design of eyeglasses, and the retailer to reduce eyeglass inventory and the need for a high number of specialized employees. In the exemplary embodiment, the system includes a user interface that allows the customer to select desired modifications with minimal guidance by the retailer. The system can be operated remotely by the customer, for instance from home, by means of a computer, an Internet connection and a digitized picture of the customer's face, or a live camera connected to the computer, without going to an optical store.

The present invention thus relieves the customer from the lengthy and potentially frustrating process of selecting eyeglass shape and style through a retailer, relieves optical retailers from storing a large inventory of shapes and styles and having to hire experienced staff to assist customers in the process of selecting eyeglass frames, and it allows eyeglass manufacturers to sell their products directly to customers without intermediary distributors and retailers.

At Page 6, line 30 through Page 7, Line 2, please see below the following replacement paragraph:

Database server 16 includes a style memory database 58, a template software database 60 and an eyeglass frame a frame size/shape selection software database 62. User device 14 includes a facial image memory database 64, a monitor/screen 66 and a digital camera 68. In an alternative embodiment, system 50 includes multiple user devices. Server 12 is connected to user device 14 via a network, such as the Internet, an Intranet, or another wide area network.

At Page 7, line 3 – 16, please see below the following replacement paragraph:

Figure 3 is an expanded version block diagram of an alternative embodiment of an interactive eyeglass system 70. System 70 includes a computer 72 that includes a database server 74, an application server 76, a web server (not shown), a fax server (not shown), a directory server (not shown), and a mail server (not shown). Computer 72, servers 16, 52, and the other servers are coupled in a local area network (LAN) 78. In one embodiment, multiple workstations are connected to computer 72 via LAN 78. Although the functions performed by the servers are illustrated as being performed by separate servers, such functions can be performed at one or multiple servers coupled to LAN 78. The servers are illustrated as being associated with separate functions only to facilitate an understanding of the different types of functions that can be performed by system 70. Database server 74 includes a style memory database 80, a template software database 82 and an eyeglass frame a frame size/shape selection software database 84. Computer 72 also includes a facial image memory database 86, a monitor/screen 88 and a digital camera 90.

At Page 7, line 17 – 23, please see below the following replacement paragraph:

Figure 4 is an exemplary embodiment of a first user interface 100 including an image of a person's face 102 and a plurality of icons 104 representing a selection of eyeglass frames. The eyeglass frames are displayed sequentially, and the user scrolls up and down using a pointing device. In an alternative embodiment, the eyeglass frame are grouped according to a particular criterion such as material, manufacturer, shape (e.g. rounder shapes, angular shapes etc.), by fashion designer, etc. and organized, for instance, into a tree structure with pull-down menus and can be searched by such groupings.

At Page 7, line 24 – 30, please see below the following replacement paragraph:

The system computes a size of the eyeglass frames for the particular facial size and features, and superimposes the selected style to the image of the user to create a virtual image of the user wearing the selected eyeglass frame. In addition, the system requests scale information, such as inter-ocular distance. If such information is unavailable to the system, the system uses a default (inter-ocular distance = 10cm), and prompts the user for the correct distance upon ordering or purchasing the eyeglass frames.

At Page 7, line 31 through Page 8, line 6, please see below the following replacement paragraph:

Figure 5 is an exemplary embodiment of a second user interface 110 including an image of a person's face 112 wearing a pair of <u>eyeglass</u> frames selected by the user from first user interface 100. Interface 110 also includes a plurality of radio buttons including a load button 114, a click button 116, a draw default button 118, a load glasses button 120, a save glasses button 122, a reset glasses button 124, and a close button 126. In addition, second user interface 110 includes a plurality of sliding buttons including a top horizontal button 128, a top vertical button 130, an outer horizontal button 132, an outer vertical button 134, an all vertical button 136, a bottom horizontal button 138, a bottom vertical button 140, a bridge button 142, a sophistication button 144, and an assertiveness button 146.

At Page 8, line 7 – 15, please see below the following replacement paragraph:

The selected shape is matched to the facial size and features of the person's face and displayed superimposed to the image of the face to create a virtual image of the user wearing the selected <u>eyeglass</u> frame. Utilizing a pointing device, such as a mouse, the user modifies the selected shape by dragging a certain number of control points 148 (seen as enlarged squares on the image) in different positions of the image. Alternatively, the user changes the shape by moving sliders 128-146 that control the horizontal and vertical position of each control point. The modified image is saved by storing the image. Another style is then loaded and the process is re-initiated. The user, at any time, can retrieve all the selected designs for comparison.

At Page 8, line 16 – 26, please see below the following replacement paragraph:

Figure 6 is an exemplary embodiment of a third user interface 160 for simultaneous view of multiple selected designs for comparison, including a first image of a person's face 162 wearing a pair of eyeglass frames selected and manipulated by the user via interfaces 100 and 110 and a second image of a person's face 164 wearing a pair of eyeglass frames selected and manipulated by the user via interfaces 100 and 110. A plurality of control points 166, modified in the previous interface, are now fixed and indicated by a "+". A user manipulates a position of the control points to alter the perceptual characteristics of the eyeglass frames as will be described in detail below. By using techniques such as collaborative filtering, the system can be prompted to suggest styles and shapes according to the preferences of other customers that best match the choices of the current customer.

At Page 9, line 9 – 19, please see below the following replacement paragraph:

After the image is stored in electronic format on system 10, the image is displayed 206 by system 10 (such as in first user interface 100 shown in Figure 4) utilizing a computer monitor, such as monitor 62 shown in Figure 2, or other visualization device (e.g. a television monitor) as describe below in greater detail. User interface 100 includes a plurality of icons each representing a different style available for purchase. Each style has been previously inputted into a database (such as eyeglass frame size/shape selection software database 62 shown in Figure 2) that includes a prototype, including color, geometric properties (e.g. tangent directions at the hinges and bridge, perimeter of the rim for rimmed eyeglass frames), reflectance properties of the material, structural properties (such as maximum curvature of the rim) as well as photographs of the eyeglass frames taken from several viewpoints.

At Page 9, line 20 – 28, please see below the following replacement paragraph:

System 10 utilizes standard techniques from computer graphics to generate an image of the eyeglass frame as seen from any viewpoint as is known in the art. (See for example, Foley et al., "Computer Graphics", Addison Wesley, 1997 [hereinafter referred to a Foley et al.] Chapter 16). Alternatively, photographs from several viewpoints can be combined to yield a panoramic view. See for example, "Quicktime VR©", a commercial product available from Apple Computer, Inc. The icons display a frontal view of the eyeglass frame. In addition, the user can select a pair of eyeglass frames and change the viewpoint by using a pointing device as is known in the art. See for example, Foley et al., Chapter 17.

At Page 12, line 21 – 26, please see below the following replacement paragraph:

Once an accepted model of the face is obtained and displayed by system 10, whether two-dimensional or three-dimensional, a set of icons is displayed adjacent the face model. Each icon represents one style of eyeglass frames available for purchase. In one embodiment, the eyeglass frames are available from a retailer. In an alternative embodiment, the eyeglass frames are available from a manufacturer. In a further embodiment, the eyeglass frames are available from a wholesaler.

At Page 12, line 27 – 31, please see below the following replacement paragraph:

The user selects a particular style by selecting an icon corresponding to a desired eyeglass frame. System 10 receives 208 the selection and uses information from the model to determine an appropriate size of the eyeglass frames. For example, the manufacturer may specify a recommended size (e.g. diameter of the lens, width of the bridge) in units of inter-ocular distance and/or as a function of the width of the eye.

At Page 13, line 1 – 16, please see below the following replacement paragraph:

The selected style, in the selected material and in the size matched to the face of the customer according to the manufacturer's guidelines is displayed on the image of the person's face to create 210 a virtual image of the customer wearing the glasses. In the two-dimensional modality, a frontal view of the eyeglass frame is rendered using standard techniques obtained from ray tracing. (See for example, Foley et al., Chapter 14). The eyeglass frames are positioned on the model so that the centers of the lenses are aligned with center of the pupils of the eyes. Alternatively, the pixel values of a photo can be substituted to the image values so as to "superimpose" the photo of the eyeglass frames glass-frames to the image of the user. If no inter-ocular distance is available, all geometric quantities will be rescaled to the inter-ocular distance as measured on the image in pixel coordinates. Although the inter-ocular distance is not an absolute number, the distance suffices for visualization, since all other geometric quantities will be scaled accordingly. However, in order for the customer to purchase an actual eyeglass frame, the system prompts the user to input an inter-ocular distance, as measured by an optometrist or as available from previous prescriptions or measured using any available method or apparatus.

At Page 14, line 4 – 8, please see below the following replacement paragraph:

In a 2 ½ -dimensional modality, the user moves his/her head and system 10 displays a chosen eyeglass frame of the image and modifies the image so that the selected eyeglass frames appear to move with the viewer and therefore seem attached to his/her head. This 2 ½ dimensional modality does not utilize a full three-dimensional model and can be implemented with a single camera.

At Page 14, line 9 – 23, please see below the following replacement paragraph:

After the eyeglass frames image has been superimposed on the image of the person's face, a feature template is selected 212, either manually by having the user click on relevant features such as the corners of the eyes, nostrils, eyebrows etc. of the image, or automatically by performing 214 correlation with a stored database of templates for eyes, mouths, eyebrows, nostrils etc. The location on an image plane that scores the highest correlation with the template is chosen as the candidate position for the corresponding feature. Each feature is then tracked from image to image frame to frame by performing correlation only in a neighborhood of the corresponding position at the previous image previous frame. In one embodiment, the size of the neighborhood is fixed or adjusted by the user. In an alternative embodiment, the size of the neighborhood is set by system 10. Alternatively, the correlation search is performed in a coarse-to-fine fashion by allowing a template to exist at several levels of resolution, and using feature locations at coarse resolution to initialize the search at the finer resolution. Coarser and finer representation of the image is obtained using standard techniques such as filtering and down-sampling, or wavelet transforms.

At Page 14, line 24 through Page 15, line 2 please see below the following replacement paragraph:

While the position of feature templates is tracked from frame to frame image to image their relative position is used to define the motion of and select 216 a reference frame. This reference frame is one of a 2-D Euclidean, 2-D affine, 2-D projective and 3-D Euclidean, in increasing order of generality. In the 2-D Euclidean case, the constellation of positions of feature locations is interpreted as moving according to a Euclidean planar motion, which is described by 3 parameters. The parameters are a translation in the plane (one component along the "x" axis and another component along the "y" axis) and a rotation about an axis perpendicular to the plane. The eyeglass frames

model is then animated by moving it rigidly onto the image plane and superimposing the eyeglass frames model onto the person's image, such that the eyeglass frames model has the same rotation and translation as the person's image. This 2-D Euclidean transformation only accounts for a restricted range of motions of the customer's head, i.e., a fronto-parallel translation and a rotation about the sagittal plane.

At Page 15, line 3 – 17, please see below the following replacement paragraph:

To accommodate rotations about a vertical axis, which the customer typically performs to see a profile, a more general transformation is necessary. The simplest translation that accommodates rotations about a vertical axis is an affine transformation, which is described by 6 parameters. The parameters include a translation and a linear deformation of the planar coordinates. This affine transformation takes into account rotations about a vertical plane only when the object of interest (in this case the eyeglass frame) is far enough from the camera, so that parallel projection is a good approximation of perspective. In particular, under a planar affine transformation parallel lines remain parallel, and therefore no "perspective" effect will be visible on the deformed appearance of the eyeglass frames glass-frames. To take into account perspective effects, a projective transformation is necessary. This is described by 8 parameters, and models the image of a plane moving rigidly in space. To the extent that the features detected are well modeled as belonging to a plane (which is a good approximation for eyebrows, nostrils, corners of eyes etc.), the model generated using a projective transformation is accurate.

At Page 15, line 24 – 30, please see below the following replacement paragraph:

The estimated transformation, whether Euclidean, affine or projective, is used to modify the appearance of the template of the _eyeglass_ frames. By animating the _eyeglass_ frames with estimated motion parameters, and rendering the _eyeglass_ frames using standard computer graphics techniques, the _eyeglass_ frames will appear as if they were attached to the person's face and moving with it. The user is then free to move his/her head around, and the face is displayed as if the glasses were being worn, thus creating a moving, virtual image of the face wearing the glasses (acting as a "virtual mirror").

At Page 16, line 7, please see below the following replacement paragraph:

Classification of _Eyeglass_ Frames and Constraints on Their Shape

At Page 16, line 8 - 14, please see below the following replacement paragraph:

While the shape of certain _eyeglass_ frames can be modified to a great extent (e.g. rimless _eyeglass_ frames) and still be manufactured at the optical store, other _eyeglass_ frames (e.g. plastic _eyeglass_ frames) can only be modified to a limited extent. Corresponding to each _eyeglass_ frame, system 10 is equipped with a database of constraints on the maximum curvature, tangents at the hinges, and other shape constraints determined by the material. _Eyeglass_ frames can be divided into three different categories depending upon the material properties of the _eyeglass_ frame and an appropriate database of constraints identified 218.

At Page 16, line 15 - 24, please see below the following replacement paragraph:

The first type of eyeglass frame is a highly deformable shape. eyeglass frames having a highly deformable shape include rimless eyeglass frames and wire eyeglass frames where the constraints on the shape is restricted only by the shape of the lens. The second type of eyeglass frame is a locally deformable shape. Eyeglass frames ~~Frames~~ having a locally deformable shape include metal eyeglass frames whose shape can be molded on the shape of the lens, as long as the shape preserves the perimeter, tangent at the hinges and bridge, and maximum curvature specified by the manufacturer. The third type of eyeglass frame is a minimally deformable shape. Eyeglass frames ~~Frames~~ having a minimally deformable shape include plastic eyeglass frames whose shape can be deformed to a small extent, while preserving perimeter, tangent at the hinges, and maximum curvature.

At Page 16, line 25 - 32, please see below the following replacement paragraph:

In addition, a custom deformation option (CD) refers to the option, presented to a customer, to realize deformation not possible at the optical store. The shape and design information is transmitted to a manufacturer that fabricates a custom eyeglass frame to be shipped to the customer. The modifications allowed under the CD option depend upon the manufacturing facilities and the production plan adopted by the manufacturer. Based upon the style chosen by the customer, system 10 permits certain modifications and warns the user when a modification to be made requires the CD option.

At Page 17, line 1 - 20, please see below the following replacement paragraph:

The user modifies 220 the selected eyeglass frames as described below. The shape of each of the eyeglass frames stored in memory is represented as a parameterized curve. In the exemplary embodiment, the curve is represented by a spline having a certain number of control points. For rimmed eyeglass frames, the cordal representation of the control points is used so that the perimeter of the front rim is approximately constant. The contour is then represented by a piecewise linear curve, where the control points are the junctions between linear segments. Once a style has been selected, the user is allowed to modify the shape interactively using a pointing device and changing the position of each control point, highlighted in the display by a square or a cross, or other identifier. In the case of rimmed eyeglass frames, where the contour of the eyeglass frame is represented using the cordal representation, changing the position of one control point alters the position of adjacent control points as well. After the modification request has been input by the user, system 10 refines the modification by finding the closest curve that has the prescribed perimeter, as is well known and described by (Olver et al., "Differential invariant signatures and flows in computer vision: a symmetry group approach", Technical Report, Department of Electrical Engineering, University of Minnesota, Dec. 6, 1996). In addition to changing the position of the control points by dragging them using a pointing device, the customer moves the control points by acting on a set of rulers that correspond to the horizontal and vertical position of each control point.

At Page 17, line 21 - 34, please see below the following replacement paragraph:

Depending upon the material properties of the eyeglass frames selected, the system only allows certain modifications. For each modification of the position of a control point, the maximum curvature is computed utilizing known techniques, such as that described in Olver et al. (ref. cit.) or using the cordal approximation. Only positions

of control points that meet the specifications on maximum curvature are permitted by system 10. The constraints on modifications determine a region where control points can be moved, outside which the eyeglass frame does not meet the specifications set by the manufacturer. For rimless eyeglass frames the region will be large, while for plastic rimmed eyeglass frames the region will be small. In the cordal representation these constraints can be easily taken into account. The tangent at the hinges is kept constant by not allowing the two control points adjacent to the hinges to be modified. The maximum curvature is kept below a certain bound that depends upon the material of the particular eyeglass frame being designed. The maximum curvature is kept below the certain bound by limiting the maximum angle between two adjacent segments.

At Page 18, line 1 - 14, please see below the following replacement paragraph:

In addition to allowing the user to modify the shape of the eyeglass frames by acting on the control points that represent the contour of the lens, system 10 changes the shape of the eyeglass frames by controlling the amount of certain perceptual properties of the shape of the eyeglass frames as described below. System 10 includes a database of maps between shape and perceptual characteristics. In the simplest instance, the user defines a one-to-one map between the position of a control point and a perceptual characteristic. For instance, the horizontal position of the intersection of the tangents at the edges of the top rim is put in one-to-one correspondence with perceived "aggressiveness". When such a point is close to the center of the face, and therefore the upper rim appears to slant outward, the corresponding shape is declared as "non-aggressive", while when such a point is close to the outside edge, so that the upper rim slants inward, the corresponding shape is declared to be "aggressive"; in between these two positions there is a continuum of eyeglass frames, see, for example, Figures 5 and 6.

At Page 19, line 3 - 14, please see below the following replacement paragraph:

The map database is flexible, since it has to fit the desires and the specifications of the manufacturer and/or the retailer. In particular, the manufacturer and/or the retailer are able to choose which perceptual characteristics to use as a "basis", depending upon the particular eyeglass frame selected, or depending upon the particular clientele expected at a particular optical store. A characteristic of the design, however, is the presence of a map between geometric features and perceptual characteristics. In the exemplary embodiment, the features map is constructed ad-hoc by associating the perceptual characteristic "aggressiveness" to a horizontal position of the central control point of the upper contour of the rim. The map between the position of control points and a set of perceptual properties such as assertiveness, personability, conservativeness, intellectuality etc. represents a re-parameterization of the state-space of the eyeglass frame, which is the position of each control point.

At Page 19, line 24 - 29, please see below the following replacement paragraph:

Once a selected style and shape is considered to be satisfactory by the user, it is stored 224 by system 10 upon the transmission by the user of a save command, such as the user selecting a save icon. System 10 then allows the user to select a different eyeglass frame style and initiate the design process again. At any point in time the user can retrieve all selected eyeglass frame and view them one next to the other for comparison, as shown in Figure 6.

At Page 19, line 31 through Page 20, line 5, please see below the following replacement paragraph:

After the customer has saved a number of preferred choices of shapes and styles, system 10 uses collaborative filtering 226, such as described in US Patents 4,870,579 and 4,996,642 to identify shapes and styles that are preferred by groups of customers whose choices most closely resemble the choices of the current customers. System 10 receives customer requests for assistance in selecting <u>eyeglass</u> frames upon the user selecting a help icon. System 10 then displays to the user choices obtained via collaborative filtering.

At Page 20, line 7 - 15, please see below the following replacement paragraph:

As described above, server 12 is connected to application server 52. In one embodiment application server 52 controls a lens-cutting machine. In addition, application server 52 ~~controls a~~ <u>controls an eyeglass</u> frame manufacturing machine. Server 12 transmits information and data to application server 52 which is utilized to fabricate 228 the lens and the <u>eyeglass</u> frame. The shape of the lens is determined by a parametric curve that is transmitted electronically to the lens-cutting machine which grinds a dummy lens to which the <u>eyeglass</u> frame is fitted. Since different grinders represent the shape of the lens differently, the interface between system 10 and the particular grinder converts the parameterization into the format used by the particular grinder.

At Page 20, line 16 - 19, please see below the following replacement paragraph:

Once the eyeglasses are fabricated, the eyeglasses are ready for the customer to try on to determine the comfort of fit of the selected design. If the eyeglass frame has been selected using the CD option, the data are transmitted directly to the manufacturer via system 10 for manufacturing.

At Page 20, line 29 - 32, please see below the following replacement paragraph:

After the appropriate modifications have been chosen, the design is transmitted to the manufacturer, together with prescription information when applicable (including inter-ocular distance), and the complete eyeglass frame glass frame is shipped directly to the customer.